

CLAIMS

1. A balanced splitter comprising:

an unbalanced line comprising a first strip line and a second strip line that are connected in series;

an unbalanced terminal electrically connected to the first strip line of the unbalanced line;

a first balanced line comprising a third strip line electromagnetically coupled to the first strip line, and a fourth strip line electromagnetically coupled to the second strip line;

a first balanced terminal comprising two terminals, one and the other of the two terminals being electrically connected to the third strip line and the fourth strip line of the first balanced line, respectively;

a second balanced line comprising a fifth strip line electromagnetically coupled to the first strip line, and a sixth strip line electromagnetically coupled to the second strip line;

a second balanced terminal comprising two terminals, one and the other of the two terminals being electrically connected to the fifth strip line and the sixth strip line of the second balanced line, respectively;

a first resistor electrically connected between the first balanced terminal connected to the third strip line and the second balanced terminal connected to the fifth strip line; and

a second resistor electrically connected between the first balanced terminal connected to the fourth strip line and the second balanced terminal connected to the sixth strip line.

2. A balanced splitter comprising:

a first strip line having one end and the other end;

a second strip line having one end and the other end, the other end being electrically connected to the other end of the first strip line;

an unbalanced terminal electrically connected to the one end of the first strip line;

a third strip line having one end and the other end, the one end being electrically connected to a ground;

a fourth strip line having one end and the other end, the one end being electrically connected to the ground;

a first balanced terminal comprising two terminals, one and the other of the two terminals being electrically connected to the other end of the third strip line and the other end of the fourth strip line, respectively;

a fifth strip line having one end and the other end, the one end being electrically connected to the ground;

a sixth strip line having one end and the other end, the one end being electrically connected to the ground;

a second balanced terminal comprising two terminals, one and the other of the two terminals being electrically connected to the other end of the fifth strip line and the other end of the sixth strip line, respectively;

a first resistor electrically connected between the other end of the third strip line and the other end of the fifth strip line; and

a second resistor electrically connected between the other end of the fourth strip line and the other end of the sixth strip line,

wherein,

the one end of the second strip line is an open end; and

the first strip line and the third strip line are electromagnetically coupled to each other such that the one ends and the other ends thereof are opposed to each other, the first strip line and the fifth strip line are electromagnetically coupled to each other such that the one ends and the other ends thereof are opposed to each other, the second strip line and the fourth strip line are electromagnetically coupled to each other such that the one ends and

the other ends thereof are opposed to each other, and the second strip line and the sixth strip line are electromagnetically coupled to each other such that the one ends and the other ends thereof are opposed to each other.

3. A balanced splitter comprising:

a first strip line having one end and the other end;

a second strip line having one end and the other end, the other end being electrically connected to the other end of the first strip line;

an unbalanced terminal electrically connected to the one end of the first strip line;

a third strip line having one end and the other end, the other end being electrically connected to a ground;

a fourth strip line having one end and the other end, the other end being electrically connected to the ground;

a first balanced terminal comprising two terminals, one and the other of the two terminals being electrically connected to the one end of the third strip line and the one end of the fourth strip line, respectively;

a fifth strip line having one end and the other end, the other end being electrically connected to the ground;

a sixth strip line having one end and the other end, the other end being electrically connected to the ground;

a second balanced terminal comprising two terminals, one and the other of the two terminals being electrically connected to the one end of the fifth strip line and the one end of the sixth strip line, respectively;

a first resistor electrically connected between the one end of the third strip line and the one end of the fifth strip line; and

a second resistor electrically connected between the one end of the fourth strip line and the one end of the sixth strip line,

wherein,

the one end of the second strip line is electrically connected to the ground; and

the first strip line and the third strip line are electromagnetically coupled to each other such that the one ends and the other ends thereof are opposed to each other, the first strip line and the fifth strip line are electromagnetically coupled to each other such that the one ends and the other ends thereof are opposed to each other, the second strip line and the fourth strip line are electromagnetically coupled to each other such that the one ends and the other ends thereof are opposed to each other, and the second strip line and the sixth strip line are electromagnetically coupled to each other such that the one ends and the other ends thereof are opposed to each other.

4. The balanced splitter according to any one of Claims 1 through 3, wherein the first, second, third, fourth, fifth, and the sixth strip lines are $1/4$ wavelength strip lines.

5. The balanced splitter according to any one of Claims 1 through 3, wherein a resistance value of the first resistor and a resistance value of the second resistor are each $1/2$ of the sum of a balanced line characteristic impedance value of the first balanced terminal and a balanced line characteristic impedance value of the second balanced terminal.

6. A balanced splitter, wherein,

first, second, third, fourth, fifth, and sixth strip lines, and ground electrodes are laminated on top of one another through the intermediation of dielectric layers to form a laminate, and an unbalanced terminal, a first balanced terminal and a second balanced terminal, and a ground terminal are provided to a surface of the laminate, the first balanced terminal and the second balanced terminal each comprising two terminals;

the unbalanced terminal is electrically connected to the first strip line of an unbalanced line comprising the first strip line and the second strip line that are connected in series;

one and the other of the first balanced terminals are electrically connected to the third strip line and the fourth strip line of a first balanced line, respectively, the first balanced line comprising the third strip line electromagnetically coupled to the first strip line, and the fourth strip line electromagnetically coupled to the second strip line;

one and the other of the second balanced terminals are electrically connected to the fifth strip line and the sixth strip line of a second balanced line, respectively, the second balanced line comprising the fifth strip line electromagnetically coupled to the first strip line, and the sixth strip line electromagnetically coupled to the second strip line;

a first resistor is electrically connected between the first balanced terminal connected to the third strip line and the second balanced terminal connected to the fifth strip line; and

a second resistor is electrically connected between the first balanced terminal connected to the fourth strip line and the second balanced terminal connected to the sixth strip line.

7. The balanced splitter according to Claim 6, wherein with respect to a laminating direction of the dielectric layers, the ground electrodes are respectively arranged in an upper layer portion, a middle layer portion, and a lower layer portion of the laminate, the first, third, and fifth strip lines are arranged between the ground electrode in the upper layer portion and the ground electrode in the middle layer portion, and the second, fourth, and sixth strip lines are arranged between the ground electrode in the middle layer portion and the ground electrode in the lower layer portion.

8. The balanced splitter according to Claim 6, wherein with respect

to a laminating direction of the dielectric layers, the ground electrodes are respectively arranged in an upper layer portion, a middle layer portion, and a lower layer portion of the laminate, the second, fourth, and sixth strip lines are arranged between the ground electrode in the upper layer portion and the ground electrode in the middle layer portion, and the first, third, and fifth strip lines are arranged between the ground electrode in the middle layer portion and the ground electrode in the lower layer portion.

9. The balanced splitter according to any one of Claims 6 through 8, wherein the surface of the laminate is provided with an external terminal for electrically connecting one of the first resistor and the second resistor.

10. The balanced splitter according to any one of Claims 6 through 9, wherein the first resistor and the second resistor are arranged on the surface of the laminate.